

Math 102

Modern Precalculus

Homework Problems – January 31, 2009

Practice Problems

Instructions:

- Graph the parabola using the derivative method shown in class (vertex and other point)
- Plot the points on the parabola that correspond to the x-coordinate or y-coordinate provided (find the x or y needed to plot the point)
- Draw the lines tangent through the given points then find the equations of the tangent lines
- Find the equation of the tangent lines (using point-slope formula: $y - y_0 = m(x - x_0)$)
 - Remember you will need an x, y and m to get the equation of the line
 - Use the derivative to find slope
 - $\left. \frac{dy}{dx} \right|_{x=?} = m$ for $y = ax^2 + bx + c$
 - $\left. \frac{1}{\frac{dx}{dy}} \right|_{y=?} = m$ for $x = ay^2 + by + c$
- Draw the tangent lines and find the point of intersection between the two lines

Pg. 12 – 13 Nos. 5 & 6

5. $y - x^2 = 6x + 20$ Tangent line x-coordinates are: $x = -4$ and $x = 0$

6. $y - 2x = x^2 + 6$ Tangent line x-coordinates are: $x = 3$ and $x = -2$

Pg. 17 Nos. 7 & 8

7. $2x + y^2 = 6$ Tangent line y-coordinates are: $y = -2$ and $y = 1$

8. $2x = y^2$ Tangent line y-coordinates are: $y = -2$ and $y = 0$